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PRESENT-DAY PROBLEMS OF PHARMACOLOGY

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About 40 reports dealing with pharmacological problems were presented at the Eighth All-Union Congress of Physiologists, Biochemists, and Pharmacologists.

S. V. Anichkov (Leningrad) described the action of various pharmacological agents on the nervous system, depending on the chemical constitution of the agents. This interesting report was received very favorably.

At meetings of the section of pharmacology, the following principal problems were discussed: new drugs, the mechanism of the action of drugs, interrelationships between pharmacological activity and the chemical constitution of substances, the preparation of drugs of vegetable origin, experimental therapy of pathological processes, and problems of toxicology.

M. D. Mashkovskiy (Moscow) reported the achievements of the Division of Pharmacology, All-Union Scientific Research Chemicopharmaceutical Institute imeni S. Ordzhonikidze. At the laboratory of this institute successful results were achieved in the synthesis and pharmacological investigation of gangliolytic and curariform drugs (pentamine, diplacin, and pyrolaxon [flaxedil]), spasmolytic drugs (spasmolytin [or diphacetylhydrochloride of the diphenylacetic acid ester of diethylaminoethanol], tiphen [hydrochloride of the thiodiphenylacetic acid ester of diethylaminoethanol]), antihistaminic drugs (dimedrol [lydol]), and other drugs having chemotherapeutic activity (bigumal [paludrine], phthivazid). Recently at this institute the compound aminazine was synthesized. Aminazine is a compound of the phenothiazine series which has interesting and valuable properties. I. M. Sharapov subjected to study at the laboratory of the institute 20 different compounds in the series of derivatives of quinuclidine careoxylic acids and of piperidine boxylic acids. Two of the compounds investigated by Sharapov proved to be active ganglion-blocking agents.

N. S. Kharchenko and his collaborators (Khar'kov) dealt in their report with new drugs which have a hypotensive activity. Unfortunately, the authors did not give a comparative characterization of the newly obtained substances in relationship to other, well-known agents which lower the blood pressure. The investigation of the substances that had been synthesized was carried out in a rather inadequate manner, without using the pharmacological methods that would have been necessary. For that reason the data presented in the report were not sufficiently convincing.

The communication by A. I. Cherkes (Kiev) concerning the mechanism of the action of cardiovascular drugs is of great interest and deserves further study. The mechanism of the initiation of excitation in afferent structures was studied by M. L. Belen'kiy (Riga). He investigated the effect of pharmacological agents on various biochemical reactions which are observed during processes of excitation. A. K. Sangayle (Sverdlovsk) demonstrated the possibility of lowering the sensitivity to pain by means of compounds which do not have a specific analgesic activity. For this purpose compounds which act on the higher nervous activity, i.e., bromides, phenamine, strychnine, and preparations derived from "kolyuchnik" can be used. Somewhat peculiar was this author's reference to the psychoprophylactic method as a means of eliminating pain in connection with childbirth. This method is not a means of eliminating pain, but has the sole purpose of preparing pregnant women for childbirth.

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S. M. Dionesov (Blagoveshchensk) discussed the characteristics of the action of hypnotics following nociceptive irritations. He demonstrated that after nociceptive irritations the action chloral hydrate is reinforced, while that of medinal [barbital] and barbamyil is weakened. A certain amount of perplexity was produced by a report of G. N. Kassil' (Moscow) dealing with the significance of nerve reception and of the physiological background in reactions of the organism to chemical irritations. The material presented by this author comprises data which require further precision in the light of known factors that have a bearing on differences in the sensitivity of different receptor zones.

G. A. Ponomarev (Moscow) convincingly demonstrated that with the aid of pharmacologically active substances (for instance, insulin and glucose) one may exert an influence on the duration of the action and local concentration of drugs in the organism. Syuy Bin, aspirant at the Chair of Pharmacology of the Leningrad Medical Institute, investigated the action of some new analgesic drugs on conditioned reflexes. This author established that analgesic agents, in addition to having common properties as far as their action on conditioned reflex activity is concerned, also exhibit individual, specific characteristics.

In a report by V. Zakusov and his collaborators, data were presented on the effect of pharmacological agents on the functional mobility of different links of the reflex arc.

Investigations dealing with the dependence of the pharmacological action of substances on their chemical constitution were represented very inadequately at the congress. S. Ya. Arbuzov (Leningrad) gave a comparative evaluation of the pharmacological action of new stimulants of the nervous system in dependence on their chemical constitution. At Arbuzov's laboratory more than 20 derivatives of phenamine were studied from this standpoint. The new analeptic drug phenatin and some of its derivatives proved to be less toxic and milder in their stimulating action on the nervous system than phenamine. As proven by experiments, the replacement of hydrogen atoms in the molecule of phenamine with more complex alkyl and substituted phenyl radicals substantially modified the pharmacological activity of the substances obtained.

The interrelationships between the constitution and activity of some new cholinolytic substances were subjected to study by M. Ya. Mikhel'son (Leningrad). He showed that by modifying the chemical constitution one may obtain pharmacological agents which exert a selective action on different cholinergic links of the central and peripheral nervous system. A detailed investigation was carried out by Z. I. Vedeneyeva (Leningrad). She studied the connection between the structure and activity of esters of dialkylaminoethanol, trialkylaminoethanol, dialkylaminoacetic acid, and trialkylaminoacetic acid. The data obtained lead to the conclusion that a change in the distance between the carboxyl carbon and the nitrogen in the esters is of great significance for the cholinolytic activity and local anesthetic activity. When the ester group is replaced with an amide group, the pharmacological activity of the esters is substantially modified.

G. A. Mednikyan (Kalinin) investigated the pharmacology of new pyridone-imine derivatives. His investigations showed that the derivatives of pyridone-imine have a hypotensive activity and, in addition, the capacity to reinforce the action of acetylcholine.

New achievements in work on new drugs of plant origin were discussed by M. A. Angarskaya (Khar'kov), A. D. Turova (Moscow), I. E. Akopov (Samarkand), K. V. Drake (Khabarovsk), and others. These reports dealt with the pharmacological investigation of new cardiovascular drugs, i.e. preparations derived from lagochilus, ginseng, and the Chinese limonnik [Schizandra Chinensis].

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N. V. Lazarev (Leningrad) dwelt on the experimental drug therapy of basic pathological processes. Particular attention was paid by Lazarev to the possibility of controlling the course of the inflammation process with the aid of various pharmacological agents. This author presented some information on the use of pharmacological agents in the therapy of leukoses.

N. A. Kharkhuzov (Leningrad) outlined his data on the drug therapy of hyperkineses of central origin. The results obtained by Kharkhuzov are of practical significance and can be used in the therapy of various spasmodic conditions in human beings. V. I. Zavrazhnyy (Voronezh) presented data on experimental myocarditis in rabbits. The course and outcome of this disease in rabbits subjected to the action of various pharmacologically active agents were investigated. The author of the paper was able to establish that a beneficial effect is exerted by glucose, strophanthus extract, metacil [4-methyluracil], and pentoxyl on the course of experimental myocarditis in various stages. Sleep produced by barbamyil had a harmful effect on the course and outcome of the disease.

The theoretical side of a report by S. I. Zakrivdoroga (Chernovtsy) proved unsatisfactory. This investigator reported on the effects of some drugs on the processes of debilitation and restoration of the organism. The principle according to which the pharmacological agents were selected by him and the purpose of the investigation remained unclear. The theoretical perceptions which guided G. A. Tskimanauri (Tbilisi) in the selection of chemical compounds entering into the composition of an antishock liquid proposed by him were difficult to understand. The attempt of this author to study the comparative therapeutic activity and practical effectiveness of a number of pharmacologically active substances on frogs was completely unsuccessful.

V. M. Karasik (Leningrad) presented an interesting report on the physiological indexes which characterize the disturbance by toxic action of the balance of macroergic bonds. The material presented by him makes it possible to establish differences in the strength of macroergic bonds of contractile protein and of other proteids. A report by K. S. Shadurskiy (Minsk) and collaborators dealt with the pharmacology and toxicology of organophosphorus compounds. This group of investigators subjected to study more than 70 derivatives of phosphoric acid differing in chemical constitution. It was shown in the work in question that the phosphorus compounds have the property of inhibiting the activity of cholinesterase, of increasing the secretion of the salivary glands, of exerting an influence on the cholinergic and adrenergic innervation, of raising the tonus of the smooth musculature, of changing the sensitivity of animals to poisons which produce a spasmodic effect and to cardiac glycosides, and of exerting an antitumor effect. A number of phosphorus compounds is recommended [on the basis of this work] for clinical investigation in the ophthalmological clinic because they may prove useful as antiglaucoma agents and also for testing as antitumor drugs.

In a paper by L. I. Medved' (Kiev) experimental data were given on the reflex mechanism involved in the action of mercury-organic and organophosphorus insecticides. On the basis of the experiments described, it was established that these compounds, being enzyme poisons, produce changes in the central nervous system of animals on being administered even in small doses. The effect of these toxic agents on the chemoreceptors of the carotid bulbs plays a significant part in the mechanism of their action.

Only two reports dealt with the very important problems of the pharmacology of antibiotics and of antitumor substances. A report by Z. V. Yermol'yeva et al. gave information to the participants on the contemporary status of the pharmacology of antibiotics and chemotherapy by means of antibiotics. Principal attention in this report was paid to the study of side effects

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arising on application of antibiotics of a wide antibacterial spectrum, i.e., biomycin and terramycin, and to the search for effective medicinal forms of antibiotics. L. F. Larionov (Moscow) gave a summary of results obtained in a search for antitumor drugs of the chloroethylamine type. Larionov obtained new active drugs which have a pronounced antitumor activity. A great impression on the participants at the congress was made by a report of Chzhou Tszin'-khuan [foreign name approximated from Russian] dealing with the achievements of pharmacological science in the People's Republic of China and a paper by P. Nikolov (Bulgaria), who has investigated the very important problem of the effect exerted by pharmacological agents on lactation.

The review given above indicates that considerable achievements have been made in the solution of a number of important pharmacological problems. However, some very timely problems are not being subjected to a sufficiently intensive study and the results achieved in their study do not correspond to the level of contemporary science in a number of cases. More attention should be paid to the synthesis of new drugs and investigation of the dependence of the pharmacological activity of these drugs on the chemical constitution. Work on the development of drugs for the therapy of radiation sickness is not being conducted on a sufficiently extensive scale. Too small a number of investigations is devoted to antitumor agents, the pharmacology of antibiotics, etc.

Among the organizational shortcomings of the congress was the selection of the reports according to [geographic] sections, which is a principle that cannot be regarded as entirely correct. It is not at all advisable to have the greatest number of cities and republics represented at a congress. The principal attention should have been paid to the quality and timeliness of the reports. Unfortunately this guiding principle has not always been followed in the compilation of the program of the congress.

The Eighth All-Union Congress of Physiologists, Biochemists, and Pharmacologists has demonstrated the progress of pharmacological science in the USSR and has determined the lines of its further development.

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